

Pf-2950/nec/us/mh

What is claimed is :

1. An apparatus for performing recording/reproducing data compatibly to plural kinds of optical disk, said apparatus including :

5 an optical head ;
an optical head control unit for controlling said optical head ;
a reproducing unit for reproducing data from said optical disk through said optical head ;

10 a recording unit for recording data into said optical disk through said optical head ; and

a disk-kind determination unit for determining a kind of said optical disk, said disk-kind determination unit further comprising :

15 a meandering frequency detecting unit for detecting a meandering frequency of an information track of said optical disk through said optical head ; and

a determination unit for determining a kind of said optical disk based on said meandering frequency detected by said meandering frequency detecting unit.

20 2. The apparatus as claimed in claim 1, further including a control unit for changing recording/reproducing conditions in accordance with said detected kind of said optical disk.

3. The apparatus as claimed in claim 1, wherein said meandering

Pf-2950/nec/us/mh

frequency detecting unit further comprises :

a clock signal extraction circuit for extracting a clock signal from a meandering signal from said optical head ; and

5 a clock frequency measuring circuit for measuring a frequency of said extracted clock signal to define said measured frequency as said meandering frequency.

4. The apparatus as claimed in claim 1, wherein said meandering frequency detecting unit further comprises :

10 a plurality of clock signal extraction circuits having different clock signal extraction frequency ranges for extracting clock signals from a meandering signal from said optical head in said different clock signal extraction frequency ranges, respectively ;

15 a selector for selecting one of said clock signals extracted in said different clock signal extraction frequency ranges ; and

a clock frequency measuring circuit for measuring a frequency of said selected clock signal to define said measured frequency as said meandering frequency.

20 5. The apparatus as claimed in claim 1, wherein said meandering frequency detecting unit further comprises :

a clock signal extraction circuit for extracting a clock signal from a meandering signal from said optical head ;

a clock signal extraction frequency range setting circuit for

Pf-2950/ncc/us/mh

setting a clock signal extraction frequency range for said clock signal extraction circuit ; and

a clock signal extraction determination circuit for determining whether or not said clock signal extraction circuit has succeeded extraction of said clock signal from said meandering signal in said clock signal extraction frequency range which has been set by said clock signal extraction frequency range setting circuit.

6. The apparatus as claimed in claim 1, wherein said meandering frequency detecting unit further comprises :

a plurality of clock signal extraction circuits having different clock signal extraction frequency ranges for extracting clock signals from a meandering signal from said optical head in said different clock signal extraction frequency ranges, respectively ;

15 a selector for selecting one of said clock signals extracted in said different clock signal extraction frequency ranges ; and

a plurality of clock signal extraction determination circuits for determining whether or not each of said plural clock signal extraction circuits has succeeded extraction of said clock signal from said meandering signal in corresponding one of said different clock signal extraction frequency ranges.

7. An apparatus for determining a kind of optical disk, said apparatus including :

PF-2950/nec/us/mh

a meandering frequency detecting unit for detecting a meandering frequency of an information track of said optical disk ; and

5 a determination unit for determining a kind of said optical disk based on said meandering frequency detected by said meandering frequency detecting unit.

8. The apparatus as claimed in claim 7, further including a control unit for changing recording/reproducing conditions in accordance with said detected kind of said optical disk.

10 9. The apparatus as claimed in claim 7, wherein said meandering frequency detecting unit further comprises :

a clock signal extraction circuit for extracting a clock signal from a meandering signal from said optical disk ; and

15 a clock frequency measuring circuit for measuring a frequency of said extracted clock signal to define said measured frequency as said meandering frequency.

10. The apparatus as claimed in claim 7, wherein said meandering 20 frequency detecting unit further comprises :

a plurality of clock signal extraction circuits having different clock signal extraction frequency ranges for extracting clock signals from a meandering signal of said optical disk in said different clock signal extraction frequency ranges, respectively ;

PL-2950/nec/us/mh

a selector for selecting one of said clock signals extracted in said different clock signal extraction frequency ranges ; and

a clock frequency measuring circuit for measuring a frequency of said selected clock signal to define said measured frequency as said 5 meandering frequency.

11. The apparatus as claimed in claim 7, wherein said meandering frequency detecting unit further comprises :

10 a clock signal extraction circuit for extracting a clock signal from a meandering signal of said optical disk ;

a clock signal extraction frequency range setting circuit for setting a clock signal extraction frequency range for said clock signal extraction circuit ; and

15 a clock signal extraction determination circuit for determining whether or not said clock signal extraction circuit has succeeded extraction of said clock signal from said meandering signal in said clock signal extraction frequency range which has been set by said clock signal extraction frequency range setting circuit.

20 12. The apparatus as claimed in claim 7, wherein said meandering frequency detecting unit further comprises :

a plurality of clock signal extraction circuits having different clock signal extraction frequency ranges for extracting clock signals from a meandering signal of said optical disk in said different clock signal

Pf-2950/nec/us/mh

extraction frequency ranges, respectively ;

 a selector for selecting one of said clock signals extracted in said different clock signal extraction frequency ranges ; and

5 determining whether or not each of said plural clock signal extraction circuits has succeeded extraction of said clock signal from said meandering signal in corresponding one of said different clock signal extraction frequency ranges.

10 13. A method for determining a kind of optical disk, said method comprising the steps of :

 detecting a meandering frequency of an information track of said optical disk ; and

15 determining a kind of said optical disk based on said meandering frequency detected by said meandering frequency detecting unit.

14. The method as claimed in claim 13, wherein said step of detecting said meandering frequency further includes :

20 extracting a clock signal from a meandering signal from said optical disk ; and

 measuring a frequency of said extracted clock signal to define said measured frequency as said meandering frequency.

15. The method as claimed in claim 13, wherein said step of

Pf-2950/nec/us/mh

detecting said meandering frequency further includes :

extracting clock signals from a meandering signal of said optical disk in different clock signal extraction frequency ranges, respectively ;

selecting one of said clock signals extracted in said different 5 clock signal extraction frequency ranges ; and

measuring a frequency of said selected clock signal to define said measured frequency as said meandering frequency.

16. The method as claimed in claim 13, wherein said step of

10 detecting said meandering frequency further includes :

setting a clock signal extraction frequency range ;

extracting a clock signal from a meandering signal of said optical disk in said clock signal extraction frequency range ; and

15 determining whether or not extraction of said clock signal from said meandering signal has been succeeded in said clock signal extraction frequency range.

17. The method as claimed in claim 13, wherein said step of detecting said meandering frequency further includes :

20 extracting clock signals from a meandering signal of said optical disk in different clock signal extraction frequency ranges, respectively ;

selecting one of said clock signals extracted in said different clock signal extraction frequency ranges ; and

determining whether or not extraction of said clock signal from

Pf-2950/nec/us/mh

said meandering signal has been succeeded in each of said different clock signal extraction frequency ranges.